

MARS SPACESHIP ABSTRACT

Abstract

This paper explores the critical design and planning considerations for a Mars mission aimed at human exploration and potential colonization. Targeted at high school and junior students, it provides a comprehensive overview of the essential components needed for a safe and successful voyage to Mars. Key topics include propulsion systems, life support mechanisms, radiation shielding, and habitat designs required for astronaut survival on such an extended journey. The proposed mission utilizes a split spacecraft approach, deploying two separate vehicles for crew and equipment, ensuring safety and operational efficiency.

Advanced technologies such as nuclear thermal propulsion and regenerative life support systems are central to the mission's design, enhancing sustainability and resource management. Additionally, this paper addresses the unique challenges of astronaut health and safety, resource sustainability, and efficient energy generation in the Martian environment. By examining these elements, this work provides a blueprint for future Mars missions, advancing our understanding of human space exploration and laying foundational knowledge for the potential colonization of Mars.